WHAT IS CLAIMED IS:

1. A method of inhibiting Mad2 function comprising contacting a Mad2 protein with a peptide that binds Mad2.

2. The method of claim 1, wherein said peptide is 9 to about 20 residues in length.

3. The method of claim 2, wherein said peptide is 12 residues in length.

4. The method of claim 2, wherein said peptide comprises a core sequence represented by the formula $X_1X_2X_3X_4X_5X_6X_7X_8X_9$, wherein:

X_1 can be any amino acid;

X_2 and X_3 are hydrophobic residues;

X_4 is a basic residue;

X_5 is a hydrophobic residue; and

at least one of X_6 to X_9 is P.

5. The method of claim 4, wherein at least two of X_6 to X_9 are P.

6. The method of claim 4, wherein said peptide comprise at least on other P.

7. The method of claim 1, wherein the peptide comprises the sequence

QWYKLX_6PP, SWYSYPPPQRAV, or DARIIKLPVPKP.

8. The method of claim 1, wherein said peptide is present in a molar excess of Mad2.

9. The method of claim 1, wherein said peptide is present in a 5-fold molar excess of Mad2.

10. The method of claim 1, wherein said peptide is present in a 10-fold molar excess of Mad2.

11. The method of claim 1, wherein said peptide is present in a 100-fold molar excess of Mad2.

12. The method of claim 1, wherein said peptide is delivered to a cell comprising said Mad2.

13. The method of claim 12, wherein said peptide is encapsulated in a liposome.

14. The method of claim 1, wherein a nucleic acid encoding said peptide and a promoter is delivered to a cell comprising said Mad2.

15. The method of claim 14, wherein said promoter is selected from the group consisting of CMV IE, RSV, and SV40 large T.

16. The method of claim 14, wherein said nucleic acid further comprises a polyadenylation signal.

17. The method of claim 14, wherein said nucleic acid is located in a viral vector.

18. The method of claim 17, wherein said viral vector is selected from the group consisting of retrovirus, adenovirus, adeno-associated virus, vaccinia virus, herpesvirus and polyoma virus.

19. The method of claim 1, wherein said Mad2 is located in a cancer cell.

20. The method of claim 19, further comprising contacting said cell with a DNA damaging agent.

21. The method of claim 20, wherein said DNA damaging agent is radiation.

22. The method of claim 21, wherein said radiation is x-irradiation, γ-irradiation, uv-irradiation, and microwave irradiation.

23. The method of claim 20, wherein said DNA damaging agent is a DNA damaging chemotherapeutic agent.

24. The method of claim 23, wherein said chemotherapeutic agent is a microtubule inhibitor or an anti-mitotic agent.

25. The method of claim 19, further comprising contacting said cancer cell with taxol.

26. The method of claim 1, wherein said peptide is linked to a nuclear targeting molecule.

27. The method of claim 26, wherein said nuclear targeting molecule is an SV40 nuclear localization signal.

28. A method of inhibiting Mad2 function comprising contacting a Mad2 protein with a peptide-mimic that binds to Mad2.

29. A method of inhibiting cancer cell proliferation comprising contacting a Mad2 protein with a peptide or peptide-mimic that binds to Mad2.

30. The method of claim 29, wherein said cancer cell is killed.

31. The method of claim 29, wherein said cancer cell is a prostate cancer cell, a breast cancer cell, a lung cancer cell, a brain cancer cell, a liver cancer cell, a pancreatic cancer cell, a stomach cancer cell, a colon cancer cell, an ovarian cancer cell, a testicular cancer cell, a head & neck cancer cell, a throat cancer cell and an esophageal cancer cell.

32. A method of treating cancer in a subject comprising administering to cancer cells of said subject a peptide or peptide-mimic that binds to Mad2.

33. The method of claim 31, wherein said subject is a human.

34. The method of claim 32, further comprising administering to said patient a second cancer therapy.

35. The method of claim 34, wherein said second cancer therapy is a DNA damaging agent.

36. The method of claim 35, wherein said DNA damaging agent is ionizing radiation.

37. The method of claim 35, wherein said DNA damaging agent is a chemotherapeutic agent.

38. The method of claim 34, wherein said second cancer therapy is taxol.

39. A method of screening for an anti-cancer agent comprising:

(a) providing a target polypeptide comprising at least the cdc20 binding domain of Mad2;

(b) contacting said target polypeptide with a candidate substance;

(c) determining the binding of said candidate substance to said target polypeptide; and

(d) in case of positive target polypeptide binding, screening for an anti-cancer effect.

40. The method of claim 39, wherein said candidate substance is a peptide.

41. The method of claim 40, wherein said peptide is selected from a peptide library.

42. The method of claim 39, wherein step (d) comprises admixing said candidate substance with a cancer cell and measuring one or more characteristics of said cancer cell.

43. The method of claim 42, wherein said characteristics include cell growth, cell viability, cell shape or cell differentiation.

44. The method claim 40, wherein step (d) comprises contacting an expression vector encoding said peptide with a cancer cell and measuring one or more characteristics of said cancer cell.

45. The method of claim 39, wherein said target peptide is expressed on the surface of a phage.